* A D - 3 2 1 4 *

AD-3214

B. Sc. (Sem. VI) Examination

March/April – 2015

Physics : Paper - VII

Time : Hours] [Total Marks : **50**

Instructions : (1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. SC. (SEM. VI)**

Name of the Subject :

☛ **PHYSICS : PAPER - VII**

☛ Subject Code No. : **3 2 1 4** ☛ Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

(2) Draw neat diagrams wherever necessary.
(3) Symbols used in the question paper have their usual meaning.
(4) Figures to the right indicate full marks of the question.
(5) Non-programmable scientific calculator can be used if necessary.

1 Answer the following questions in short : **8**

(i) Give unit of current density.
(ii) What is retentivity?
(iii) Give two examples of paramagnetic substances.
(iv) Define wave number.
(v) What is Optical Pumping?
(vi) Give full from of EDFA.
(vii) Give two properties of Laser.
(viii) What is Coherence time?

2 (a) Answer any one of the following. **10**

(i) Explain behaviour of magnetic materials in a toroid and obtain the relation $\mu_r = 1 + \underset{m}{X}$.

(ii) Explain poyting vector and obtain an expression for the rate of depletion of eletromagnetic energy.

(b) Attempt any one of the following : 4

(i) The region inside a current carrying toroidal winding is filled with tungsten of succeptibility 7.2×10^{-5}. What is the percentage increase in the magnetic field in the presence of the material with respect to the magnetic field without it?

(ii) Discuss the four equations of Maxwell in differential as well as in integral form.

3 (a) Answer any one of the following : **10**

(i) Explain in brief the Ruby Laser.

(ii) Explain spontaneous and stimulated emission in detail.

(b) Attempt any one of the following : 4

(i) Discuss main components of the Laser.

(ii) Explain the spatial coherence.

4 Write short notes on any two of the following : **14**

(i) Bohr Magneton

(ii) Plane Electromagnetic waves

(iii) He-Ne Laser

(iv) Michelson stellar Interferometer.